

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 18 October 2000 (18.10.00)	
International application No. PCT/EP00/01246	Applicant's or agent's file reference 55.0204
International filing date (day/month/year) 16 February 2000 (16.02.00)	Priority date (day/month/year) 25 February 1999 (25.02.99)
Applicant MAROY, Pierre et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 11 September 2000 (11.09.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

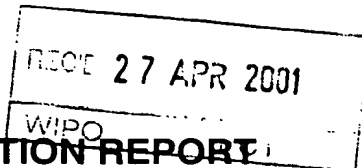
made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. E. Stoffel Telephone No.: (41-22) 338.83.38
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



14

Applicant's or agent's file reference 55.0204	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/01246	International filing date (day/month/year) 16/02/2000	Priority date (day/month/year) 25/02/1999
International Patent Classification (IPC) or national classification and IPC C04B28/02		
Applicant SOFITECH N.V.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 11/09/2000	Date of completion of this report 25.04.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Besana, S Telephone No. +49 89 2399 8002 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/01246

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-16 as published

Claims, No.:

1-8 with telefax of 23/01/2001

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☒ the claims, Nos.: 9
☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/01246

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-8
	No: Claims
Inventive step (IS)	Yes: Claims 3,6
	No: Claims 1,2,4,5,7,8
Industrial applicability (IA)	Yes: Claims 1-8
	No: Claims

2. Citations and explanations **see separate sheet**

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/01246

Re Item I

Basis of the report

1. The amendments filed with telefax dated 23.01.2001 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:

- 1.1 Claim 1 defines a method for cementing an oil well comprising

- i) forming a cement slurry
- ii) **foaming** said slurry
- iii) **injecting** a cement slurry and
- iv) allowing the cement to set.

Claim 1 as originally filed defines a method of cementing an oil well comprising

- i) **injecting** a cement slurry and
- ii) **foaming** said slurry before
- iii) allowing the cement to set.

However, there is no basis in the original application documents for the foaming step being performed prior to the injection of the cement slurry into the well.

- 1.2 The same objections applies mutatis mutandis for claim 4.
2. This report has been established as if these amendments had not been made (Rule 70.2(c) PCT).

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document:

D1: US-A-5 806 594 (STILES DAVID A ET AL) 15 September 1998
(1998-09-15)

2. The present invention relates to a method for cementing oil wells wherein low density cements are used. This cements must have good impermeability and

good mechanical and adhesive properties.

For oil wells cements the technique most frequently used to reduce the density of the cement is to add a larger quantity of water to the slurry. However, this reduces the compressive strength and the adhesive properties of the cement and increases its permeability.

A second method consists in adding a surfactant to the cement slurry and to foam the slurry before the cement sets reaching in this way the desired density.

The disadvantage of this method is that above a certain foam quality the stability of the foam decreases, while the compressive strength becomes too low and the permeability increases.

The problem to be solved by the present invention is to provide a method for cementing oil wells or the like without the above mentioned disadvantages of the prior art. Two alternative solutions are proposed respectively in claims 1 and 4 of the present application.

However, the applicant has not made it plausible that the features of claims 1 and 4 can achieve the stated aim.

In particular doubts arise whether any cement or micro-cement slurry, comprising a surfactant and a water content of less than 50%, respectively 72%, by volume can be used in the claimed method (see also Item VIII §1).

Hence, the subject-matter of claims 1 and 4 is not considered as involving an inventive step (Art. 33(3) PCT).

3. The same objection of lack of inventive step (Art. 33(3) PCT) applies mutatis mutandis for the subject-matter of dependent claims 2 and 5.
4. Dependent claims 7 and 8 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect to inventive step (Art. 33(3) PCT), in that these features are known from the person skilled in the art (see e.g. document D1: col.5 l.9-35; col.6 l.19-39).

Re Item VII

Certain defects in the international application

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/01246

1. The units gallons per sack of mixture/cement, pounds per square feet and °F employed on pages 11-15 are not additionally expressed in terms of the units stipulated by Rule 10.1(a) and (b) PCT.

Re Item VIII

Certain observations on the international application

1. Taken into account the objections in Item V § 2, essential features are missing in claims 1 and 4.
For this reason, claims 1 and 4 do not meet the requirement following from Art. 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.
 - 1.1 Furthermore, claims 1, 2, 4 and 5 do not meet the requirements of Art. 6 PCT in that the matter for which protection is sought is not clearly defined as the claims attempt to define the subject-matter in terms of the result to be achieved. The technical features necessary for achieving this result should be added (e.g. composition of the slurry, its physical characteristics, etc.).
2. The features of claims 1-8 are not referred to in the description. Claims 1-8 are therefore not supported by the description as required by Art. 6 PCT.
3. A document reflecting the prior art slurries described on page 12 Example 3, is not identified in the description (Rule 5.1(a)(ii) PCT).

CLAIMS

- 1) A method of cementing an oil well or the like, comprising:
 - 5 a) forming a cement slurry comprising:
 - i) cement;
 - ii) a surfactant; and
 - iii) water;
 - b) foaming the slurry by introduction of gas; and
 - 10 c) injecting the slurry into the well and allowing it to set;characterised in that the water content of the slurry is less than 50% by volume before foaming.
- 2) A method as claimed in claim 1, comprising forming a cement slurry having a water content of 33% to 45% by volume before foaming.
- 15 3) A method as claimed in claim 1 or 2, wherein the step of forming the slurry comprises providing a solid fraction is constituted by
 - a) 35% to 65% by volume particles with an average diameter in the range 200 μm to 600 μm ,
 - b) 20% to 45% by volume Portland cement, and
 - 20 c) 5% to 25% by volume particles with an average diameter in the range 0.5 μm to 5 μm .
- 4) A method of cementing an oil well or the like, comprising:
 - a) forming a slurry comprising:

i) a micro-cement having a maximum particle size in the range $6\text{ }\mu\text{m}$ to $12\text{ }\mu\text{m}$, with a mean particle diameter of a few microns, and a specific surface area per unit weight, determined by the air permeability test [Blaine Fineness] of more than $0.6\text{ m}^2/\text{g}$;

5 ii) a surfactant; and

iii) water;

b) foaming the slurry by introduction of a gas; and

c) injecting the slurry into the well and allowing it to set;

characterised in that the water content of the slurry before foaming is less than 72%
10 by volume.

5) A method as claimed in claim 4, comprising forming a slurry having a water content before foaming in the range 58% to 70% by volume.

15 6) A method as claimed in claim 4 or 5, comprising forming a slurry having a solid fraction of 50% to 75% by volume micro-cement, 15% to 40% by volume particles with an average diameter in the range 0.05 micrometers to 0.5 micrometers, and 0 to 20% by volume particles with an average dimension in the range 3 nanometers to 60 nanometers.

7) A method as claimed in any preceding claim, comprising introducing gas to the slurry such that the foaming quality is in the range 30% to 65%.

20 8) A method as claimed in any preceding claim, comprising including in the slurry one or more additives of the following types: a dispersing agent, an antigelling agent, a water retainer, a cement setting accelerator or retarder, or a de-foaming stabilizer.

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 55.0204	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/01246	International filing date (day/month/year) 16/02/2000	(Earliest) Priority Date (day/month/year) 25/02/1999
Applicant SOFITECH N.V.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PC 00/01246

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C04B28/02 C04B38/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C04B E21B C09K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 806 594 A (STILES DAVID A ET AL) 15 September 1998 (1998-09-15) column 2, line 33 - line 61 column 4, line 48 - line 60	1,6
A	FR 2 749 844 A (SCHLUMBERGER CIE DOWELL) 19 December 1997 (1997-12-19) page 6, line 1 - line 15 page 7, line 14 - line 25 page 8, line 28 - page 9, line 17	1,2,5-7
A	EP 0 787 698 A (HALLIBURTON ENERGY SERV INC ; MOBIL OIL CORP (US)) 6 August 1997 (1997-08-06) claims; examples	1-3,5,6, 8
A	& US 5 696 059 A 9 December 1997 (1997-12-09) cited in the application	
-/-		

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

2 June 2000

Date of mailing of the international search report

09/06/2000

Name and mailing address of the ISA

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Authorized officer

Theodoridou, E

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/01246

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 871 395 A (SUGAMA TOSHIFUMI) 3 October 1989 (1989-10-03) column 2, line 12 - line 50	1,6,7
A	EP 0 748 782 A (SOFITECH NV) 18 December 1996 (1996-12-18) cited in the application claims	3,6,8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCOMP 00/01246

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5806594	A	15-09-1998	NONE		
FR 2749844	A	19-12-1997	FR	2749843 A	19-12-1997
			CA	2207885 A	18-12-1997
			EP	0814067 A	29-12-1997
			NO	972799 A	19-12-1997
			US	6060535 A	09-05-2000
EP 0787698	A	06-08-1997	US	5696059 A	09-12-1997
			CA	2196371 A	01-08-1997
			NO	970408 A	01-08-1997
US 4871395	A	03-10-1989	NONE		
EP 0748782	A	18-12-1996	FR	2735465 A	20-12-1996
			CA	2178707 A	14-12-1996
			GB	2302091 A,B	08-01-1997
			NO	962474 A	16-12-1996